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Exploring Sustainable Supply Chain Management: A Social Network Perspective

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Exploring Sustainable Supply Chain Management: A Social Network Perspective

Abstract

Purpose – The implementation of sustainable supply chain management (SCM) calls for an acknowledgement of uncertainty inherent in complex environment. Confucianist society forms Social networks in Confucianist society, called guanxi networks, influence economic behaviours and business practices in the workplace. The objective of this study is to explore how these social networks influence the implementation of sustainable supply chain management (SCM). In doing so, this study critically investigates the constructs of guanxi networks, their impact on flow of supply chain capital, and how this leverages the implementation of sustainable SCM.

Design/methodology/approach – Two systematic literature reviews are conducted to understand the constructs of social networks in Confucianist culture and their impacts on the flow of supply chain capitals. The reviews also analyse evidence related to the economic, social and environmental practices to reveal the current state of the literature and research gaps. Propositions and a framework are developed to support future research in this area.

Findings – The constructs of *ganqing*, *renqing*, *xinren* and *mianzi* in guanxi networks have expanded the contexts of social networks in Western literature. Guanxi networks increase the flow of supply chain capital and generate trust between players, thus enhancing capabilities to implement sustainable SCM. Guanxi networks also create the mechanism of network governance with which to increase sustainable SCM implementation under the institutional logics of sustainability.

Research limitations – The conceptual framework and justification are based on the reviews of current studies in the field. Future empirical study is encouraged to test the propositions, both in Confucianist culture and other countries with culture of social networks.

Originality/value – Social networks are socially constructed concepts. The constructs of guanxi networks revealed in this study have developed the knowledge of Western-based social network theory. Besides, arguments from a social network perspective provide an alternative answer to explain increased behavioural commitment and companies’ investment in sustainable SCM. This study helps practitioners understand the logic of this social norm and to use it to maximise their operation outputs, including sustainable SCM implementation.

Keywords: sustainable SCM, social networks, guanxi networks, supply chain capitals, trust

Paper type: Conceptual paper

1. Introduction

With sustainable development a widely recognised necessity, stakeholders expect environmental and social responsibility to be considered in business operations. Sustainable initiatives have been integrated into various perspectives of supply chain management (SCM) (Beske and Seuring, 2014), and their implications have been the focus of many studies (e.g. Beske-Janssen et al., 2015; Carter and Jennings, 2004; Sarkis, 2012). However, current studies claim that 'a company is no more sustainable than the suppliers from which it sources' (Miemczyk et al., 2012, p.478), so sustainable SCM performance depends on the level of relationship governance and control of multi-tier suppliers.

To address the complexity of contemporary global value chains, increasing studies have endeavoured to investigate social networks within sustainable SCM (Beske and Suring, 2014; Miemczyk et al., 2012). Network relationships support a high level of collaboration and integration between players (Adenso-Diaz et al., 2012; Crazza et al., 2010). Individual ties underlie inter- and intra-organisational relationships, influencing corporate strategy and the 'adoption of change' required for sustainable SCM (Johnston and Linton, 2000, p.465).

Social networks are multifaceted. Different regions could embrace a variety of social constructs and expectations, such as *wasta* in the Middle East (Abosag and Naude, 2014). In this regard, this paper focuses on the investigation of *guanxi* networks - social networks in Confucianist cultures. *Guanxi* has been widely studied in marketing and management disciplines for its contribution to build mutual trust and reciprocity among people (e.g. Gao et al., 2014). In SCM, *guanxi* networks appear broadly in association with topics such as buyer-supplier relationships (Chen et al., 2011; Giannakis et al., 2012), supply chain integration (Cai et al., 2010) and knowledge sharing (Cheng, 2011). However, current studies have not yet fully captured the underlying mechanisms of sustainable SCM from a social network perspective, even though *guanxi* networks are showed to improve collaboration with suppliers in green SCM (Luo et al., 2014).

As such, this study aims to map a theoretical framework in investigating social networks towards sustainable SCM implementations. Both Victor (1991) and Seuring and Muller (2008) have drawn attention to the flow of capital in leveraging sustainability, the former considering sustainable development generally while the latter focuses on sustainable SCM. The flow of capital enhances capabilities and resource integration to overcome barriers to achieving sustainable development (Rydin and Holman 2004). The social network theoretical lens helps to illuminate how relational ties transform human talent and competitive advantages into a flow of information/knowledge, materials, cash, social relations and social control (Borgatti and Li, 2009, p.5). Therefore, the proposed framework in this study helps researchers and practitioners to understand sustainable SCM from a relational tie perspective, thereby contributing to advance knowledge in this area.

The contributions of this study are threefold. First, it develops the holistic constructs of social networks in the context of both SCM and sustainable SCM in Confucianist culture. Second, by visualising the flow of supply chain capital in social networks, the capability for managing supply chain activities is enhanced. Finally, it proposes a theoretical framework from a social network perspective to increase the implementation of sustainable SCM, contributing to the spread of sustainable practices.

Evidence to support the building of the conceptual framework was obtained from two systematic literature reviews: a review of *guanxi* networks in sustainable SCM, followed by a

review of guanxi networks in SCM. Two literature reviews are conducted because only five relevant papers were found in the first review, which gave limited insights of the topic. Therefore, the second one was conducted to shape the understanding of how guanxi networks impact on SCM, and by extension, on sustainable SCM. Compared with previous literature reviews in the field (e.g. Carter and Easton, 2011; Touboullic and Walker, 2015; Beske-Janssen et al., 2015), this study attempts to understand the current state of social network research in sustainable SCM and build the conceptual framework for further research. Aligned with the arguments from Victor (1991) and Seuring and Muller (2008), this study takes the flow of supply chain capital into account, revealing the influence of guanxi networks on sustainable SCM implementation. The flow of supply chain capital helps companies for efficient communication and effective use of natural resources and innovative approaches to achieve sustainability. The structure of the paper is as follows: after the introduction, section two gives a brief review of social network theory and its impacts on sustainable SCM. Section three gives a detailed description of the research design and findings of the literature review. The main contribution of the paper comes in section four, which presents the proposed theoretical framework of guanxi networks in sustainable SCM under the logics of institutional forces. Section five discusses the review findings and the linkage of the theoretical framework, and further justifies the academic and practical implications along with potential critiques of the topic. The final section offers concluding thoughts and proposes paths for future research.

2. Literature review

2.1 Social network theory and its impact on SCM

In the last century, various sociologists (e.g. Marx, Weber and Parson) started to investigate social networks to describe social activities and organisational behaviours. Social networks have been defined as ‘a set of nodes (e.g. people or organisations) linked by a set of social relationships of a specified type’ (Laumann et al., 1978, p.458). These social relationships are ‘socially constructed’, may include kinship and social obligations, knowledge and recognition of the identity of past and current transactions (Berger and Luckmann, 1966, p.25). In some regions, such as Asia, social networks are socially, culturally and economically specified (Chua and Wellman, 2015). This study focuses specifically on guanxi in Confucianist societies, which is regarded as the notion of ‘a relationship’ between objects, forces or people. It also has been described as a type of social network that provides a substantial exchange of mutual trust, benefits and reciprocity (Park and Luo, 2001; Yang, 1994).

Grannovetter (1973) argues that interpersonal networks provide ‘the most fruitful micro-macro bridge’ (p.1360) to turn small-scale personal interactions into large-scale patterns of influence (p.1360). Unlike universalism and bureaucracy, where rules and regulated behaviours are classified in certain categories, social networks create the mechanism of particularism, where people care about the ability to predict reliability and embrace the responsibility of each member within the network (Heimer, 1992). Social network literature has clarified the strength of connections as strong ties and weak ties based on the frequency of interaction and similarity between the two nodes (Grannovetter, 1973; 1992).

From social networks and relational points of view, guanxi often is considered a form of social capital that encompasses mutual trustworthiness (Coleman, 1988) to reduce opportunistic behaviours (Morgan and Hunt, 1994), resulting in higher levels of commitment and improved risk management in supply chains. Cheng et al. (2012) explored supply risk management through a relational approach, finding that guanxi networks between the buyer

and the supplier improve both communication and trust, thereby reducing supply risk. In addition, a stronger guanxi network generally promotes collaboration in the form of information sharing, skill acquisition and resource accessibility (Rydin and Holman, 2004). According to Xin and Pearce (1996), Chinese managers tend to obtain needed information from personal ties and social networks, and when choice is lacking, companies are compelled to rely on close partners. The obtained information and resources might not be optimal, but they are the most feasible and reliable options (Cai and Yang, 2014).

Zhuang et al. (2008) analysed data from 225 cases and argued that emotional closeness between representatives of channel partners encourages the use of non-coercive power rather than coercive power. Yang and Wang (2011) also supported the viewpoint that the stronger the investment in personal ties, the higher the levels of emotional attachment and commitment.

2.2 Sustainable SCM

Many discussions in sustainable development start with the Brundtland report (1987) and the concept of the triple bottom line. In supply chain literature, a number of studies have investigated various practical issues for providing a comprehensive understanding of sustainable SCM (e.g. Luo et al., 2014; Rennings and Wiggering, 1997) with a particular emphasis on environmental and green management (Carter and Easton, 2011; Cheng, 2011; Zhu et al., 2013). Carter and Rogers (2008) believe that sustainable SCM is 'the strategic, transparent integration and achievement of an organisation's social, environmental and economic goals (the triple bottom line) in the systemic coordination of key inter-organisational business processes for improving the long-term economic performance of the individual company and its supply chains' (p.368). It has emerged as strategically important for organisational culture to achieve long-term performance and address sustainability issues with necessary business capabilities and resources (Burgess et al., 2006; Touboullic and Walker, 2015).

To address company strategy and the culture of sustainability in supply chains, proactive firms often require sustainable SCM actions from their suppliers (Gimenez and Tachizawa, 2012; Miemczyk et al., 2012). Research has shed light on supply chain networks that include inter-connected organisations (e.g. Adenso-Diaz et al., 2012; Creazza et al., 2010). Likewise, sustainability needs to be understood from the network level (Miemczyk and Johnsen, 2012; Vurro et al., 2009).

However, in practice, companies can only commit to sustainable development when they have the necessary capabilities. Sufficient capital provides the capability for implementing environmental and social responsibilities (Victor, 1991). Therefore, this study adopts the definition of *sustainable* SCM proposed by Seuring and Müller (2008, p.1700):

The management of material, information, and capital flow, as well as cooperation among companies along the supply chain, while setting goals from all three dimensions of sustainable development (i.e., economic, environmental, and social) into account, which are derived from customer and stakeholder requirements.

Given the importance of material, information and capital flow among supply chain players, this study elicits the question of whether relational ties can increase supply chain capital flow to effectively implement sustainable SCM, considering economic, environmental and social responsibilities. According to the literature, 'relationship is the essential aspect for achieving

collaboration' and optimal performance in a green supply chain (Gunasekaran et al., 2015, p.2). Carter and Jennings (2002) employed a survey to investigate the influence of social responsibility on supplier performance. Trust and commitment are essential mediators in discussions, and research has found that buyer trust in suppliers positively increases cooperation between buyers and suppliers, improving supplier performance. Cheng (2011) has considered the relational benefits of reducing risks and sharing knowledge in green supply chains. Building on the current literature, this study has taken a social network view, endeavouring to explore the influence on sustainable SCM through enhancement of supply chain capital flow.

3. Research design

Two systematic literature reviews were conducted. The review of guanxi networks on sustainable SCM was undertaken in the first phase to consolidate knowledge of the topic and reveal the current research gap. However, this process has yielded limited number of papers. To further investigate the research topic, a second review was undertaken to reveal the role of social networks and their impact on supply chain capital flow as these arguably support the meeting of environmental and social responsibilities. The review findings ultimately enhance conceptual framework building.

The main objectives of the systematic reviews were as follows:

- 1. To understand the constructs of guanxi networks;
- 2. To investigate the influence of supply chain capital flow from the guanxi networks perspective; and
- 3. To build a conceptual framework to answer the research aim and develop propositions for future research.

To ensure a rigorous approach to the systematic reviews, the research used the method suggested by Tranfield et al. (2003), which aims to achieve thoroughness in a replicable process and helps develop the evidence base and minimise research bias. An expert panel of three experienced academic researchers were gathered for discussion of the research plan, search terms and research scope. In addition, the research findings were discussed with another six researchers who have conducted empirical studies in China, of which five are experts in the field of green and sustainable SCM, and one has published work in social capital and guanxi in SCM.

First, the review of guanxi networks in sustainable SCM was prepared. There are a broad range of contents related to sustainable SCM in the current literature, including 'green supply chain management', 'environmental supply chain management', 'environmental purchasing and supplier management', 'corporate social responsibility' and 'supply chain management ethics'. Being consistent with the current literature reviews of sustainable SCM (e.g. Touboulie and Walker, 2015; Alexander et al., 2015), the databases searched included Scopus and ABI/INFORM Global. Details of the research protocol are given in Appendix 1. Finally, four papers were obtained from Scopus and nine papers from ABI. Among these, two papers were duplicates and six of the papers from ABI were removed due to the exclusion criteria. Therefore, in total, five peer-reviewed papers were used in the review of guanxi in sustainable SCM.

Content analysis was applied to analyse the data (Seuring and Gold, 2012), and the results are presented across sustainable SCM themes. Given this initial search, observation shows that

the influence of social networks on sustainable SCM requires further elaboration. Thereby, another systematic literature review was conducted to examine the influence of guanxi networks on SCM in order to acknowledge the impact on supply chain capital flow and support to theoretical framework building.

For the second review, a detailed research protocol is given in Appendix 2. To identify publications, papers had to contain guanxi in the title, abstract or keywords, plus one term from a broad range related to supply chain functions (supply, logistics, procurement, production, inventory, warehousing and manufacturing) in any database field. The online databases of selected publishers were searched: Elsevier (Science Direct), Emerald, Taylor & Francis, Sage and Wiley. These publishers covered the most relevant management journals without filtering out other topic-related sources, such as the *Asia Pacific Business Review*. The search was conducted in December 2017, and the timeframe covered from 1995 after initial research indicated no significant studies beforehand. It is acknowledged that other databases can also feature occasional relevant articles (Walker et al., 2015). Therefore, a Scopus database search with the same criteria confirmed the coverage of sufficient evidence in this study.

The selection process was summarised in Figure 1. In total, 464 papers were in the pool after the initial search, together with 277 papers found in the Scopus database. Cross-checking the duplication of publishers and database, 28 papers from Scopus were added to the sample. To select the most relevant papers, the first filtering criterion was to select the papers which are relevant in the subject areas by checking the title, abstract, keywords, introduction and conclusion. Further filtering criteria was applied to identify those papers involving substantive connection between guanxi and supply chains. These processes yielded to a final sample of 154 papers.

To synthesise the 154 identified papers, relevant coding categories were used, including basic demographic information, constructs of guanxi networks, impacts on SCM and sustainable SCM. The approach of content analysis was adopted for constructing the findings.

-----Figure 1-----

To ensure validity and reliability, information for each category was recorded in an Excel spreadsheet. Additionally, results of pre-coding for first 20 papers were compared within the panel to assess the quality of the searched databases and to verify the coding strategies according to the research questions, which is important in ensuring research quality (Seuring and Gold, 2012). Discussions with the six external researchers additionally verified the findings in this study.

4. Analysis and findings

A literature review is 'a systematic, explicit, and reproducible design for identifying, evaluating, and interpreting the existing body of recorded documents' (Fink, 2005, p.3). To analyse review findings, this study applied a content analysis method to capture both qualitative and quantitative primary data and to interpret the underlying meanings of terms and arguments (Mayring, 2000; Seuring and Gold, 2012). This, then, informed the framework developed in section five.

4.1 The influence of guanxi networks on sustainable SCM

Observations in this study revealed a lack of in-depth insights into the influence of guanxi networks on sustainable SCM. Green supply chain management seemed to be the main focus of discussion (Table 1). Conceptually, it is argued that guanxi networks could leverage business performance in SCM, including green management (Geng et al., 2017). Luo et al. (2015) have addressed this argument with empirical evidence that guanxi mediates the buyer-seller relationship and affects decision making to implement green supply chain collaboration. At micro level, guanxi networks generate an ‘ethic of sustainability’ (Hammond and Glenn, 2004, p.24) to create trust and reciprocity as a social norm. According to Zhan et al. (2016), guanxi networks in the workplace influence mind-set and attitude, leadership and management style, and employee involvement. Therefore, guanxi is an important antecedent to green and lean practice for environmental performance. From a social capital perspective, guanxi networks reduce relational risk among actors, as a result of increasing the willingness of knowledge sharing regarding the green supply chain (Cheng, 2011).

The impact of guanxi networks are far more multifaceted, with both positive and negative effects on society (Chen et al. 2011). Zhuang et al. (2014) show that guanxi networks might have both of positive and negative impact on purchasers’ decision making for ethical procurement, depending on the strength of guanxi policy. Conversely, Luo et. al (2015) indicate that a higher degree of guanxi among supply chain actors can reduce the willingness to implement green supply chain collaboration. Overall, however, there is insufficient evidence to conclude to what extent guanxi networks act positively or negatively towards sustainable practices in supply chains. This remains an opportunity for further investigation.

-----Table 1-----

Meanwhile, different perspectives on the influence of guanxi networks on the ‘three pillars’ of SCM were gathered in the second review (Table 2). Guanxi networks have been particularly found to improve in economic performance, including a reduction in transaction costs (Hsu et al., 2011), increased market and business performance (Lobo et al., 2013) and financial profitability (Chen et al., 2011). Guanxi networks are believed to influence long-term business development. Based on an empirical study from Lobo et al. (2013), vegetable farmers show a tendency to trust and collaborate with buyers sharing the same guanxi networks.

A few studies have also captured some factors of social and/or environmental responsibilities (Table 2). Cai and Yang (2014) showed the mediating role of guanxi networks in managers’ decision-making in green supply chain collaborations. Guanxi networks shaped stakeholders’ knowledge and perceptions to influence social and environmental policymaking (Hills and Man, 1998). Through collaboration among supply chain actors, guanxi stimulates the upgrading of technology to deal with waste and pollution (Hills and Man, 1998; Wang and Woods, 2013). Other relevant studies, including Michailova and Worm (2003), Ling and Li (2011) and Chen et al. (2013), have touched on the influence of guanxi networks on the implementation of social responsibilities. These fragmented studies suggest the need for further theoretical development into the influence of guanxi networks on sustainable SCM.

-----Table 2-----

Through both of the literature reviews this study found that current literature is focused on environmental practices, consistent with other reviews of sustainable SCM (e.g. Carter and Easton, 2011; Gimenez and Tachizawa, 2012). However, sustainability is more than simply green or environmental management (Carter and Rogers, 2008; Seuring and Müller, 2008). Therefore, this field needs further elaboration; environmental, social and economic responsibilities must be simultaneously considered in the context of social networks and SCM.

4.2 The constructs of *guanxi*

In the review, the constructs of *guanxi* networks were deductively developed from previous studies (e.g. Hwang, 1987; Park and Luo, 2001), comparing and contrasting terminologies in Western studies of social network theory (Table 3). The constructs of *guanxi* networks include four dimensions—*renqing*, *ganqing*, *xinren* and *mianzi*—and the presence of each of these within the selected papers was examined (Appendix 3).

-----Table 3-----

Renqing (i.e. reciprocity) is the most common dimension examined in SCM research as reciprocation and exchanging behaviours are fundamental human social processes (Robins, 2015). It is the owing of a favour (Wong and Leung, 2001); when people offer *renqing*, they often expect to receive a favour in turn. The notion of exchanging mutual favours and reciprocity becomes a motive for building business *guanxi* (Chen et al., 2011; Yen et al., 2010). As such, *renqing* includes reciprocity, obligation, favours, behavioural exchange and dependency. Reciprocity generates transactional benefits in a type of bilateral governance of dependency and behavioural exchanges (Zhuang et al., 2010; Park and Luo, 2001). It then implies a social mechanism for accessing desirable resources within a stable and structured social network. In social network studies, reciprocation and exchanging behaviours are fundamental human social processes (Robins, 2015). Justice orientation is a moral vision which draws attention to reciprocity and equal respect (Heimer, 1992). In this regard, reciprocity is less likely to be hierarchical in its function of offering and receiving favours (Hwang, 1978), however, the influence is significant in deepening and strengthening the buyer-supplier relationship in SCM (Luo et al. 2015).

Ganqing is similar to the context of care orientation in social network studies. It means individuals' mutual empathetic understanding, affection, sharing and emotional identification (Yang, 1994; Yen et al., 2011). It is the other moral injunction of drawing attention to people's needs and responding with care (Heimer, 1992). *Ganqing* describes the quality of a relationship between interactions (Barnes et al., 2011; Chen and Chen, 2004; Yen et al., 2011). Barnes et al. (2012) statistically tested the role of *ganqing* in cooperation and coordination in SCM and found that *ganqing* positively influences cooperation between buyers and suppliers, which drives satisfaction and SCM performance. Both mechanisms – justice orientation and care orientation – require people to treat others fairly and not ignore other's needs to continually sustain good *guanxi* networks.

Xinren refers to trust and trustworthiness (Chen and Chen, 2004; Yen et al., 2011). Findings from the review show that trust is the central value in *guanxi* networks and has been mostly emphasised in business practices. Cai et al. (2010) used structural equation modelling to

analyse collected data from 398 Chinese organisations and observed the importance of how guanxi affects trust between players, which positively impacts information sharing. In social networks, it is morally right to be trustworthy in economic life (Grannovetter, 1992). Distrust, opportunism and disorder do not disappear in social networks, but the trust embedded in relationships leads individual behaviours to conform to predictable patterns. Good guanxi ties increase predictability with traits such as consistency, responsibility and benevolence (Jeffries and Reed, 2000; Ring and Van de Ven, 1994), resulting in smoother transaction arrangements (Wiegel and Bamford, 2015) and the reduction of behavioural opportunism (Lu et al., 2009).

Mianzi is a crucial concept in Confucian cultures, in which individuals' respect, pride and dignity are important (Leung et al., 2011). *Mianzi* is defined as the 'projection of self-image and impression management' (Hwang, 1987, p.960). *Mianzi* has a hierarchical context (Hwang, 1987), representing an individual's social influence based on continuous cultivation of positive social status and long-term mutual satisfaction. Though *mianzi* does not frequently appear in SCM literature, it is an intangible social resource affected by an individual's social position and, in turn, impacts on one's ability to obtain material wealth when counterparts give 'face' (Park and Luo, 2001; Shou et al., 2011). In their empirical study, Yen and Barnes (2011) argued that saving 'face', in Taiwanese buyers' perceptions, positively impacts buyer-seller relationships in a process evolving over time.

From the previous studies, we argue that the four dimensions of guanxi are interlinked (Figure 2). When *ganqing* is manifested, such as in dining and gift giving, it is a way of exchanging *renqing* (Yen et al., 2011). *Xinren* is a notion either embedded in *ganqing* or developed through repeating satisfaction in the exchange of *renqing*. In turn, embracing *xinren* from both parties, in the long term, encourages the exchange of *ganqing* and *renqing* and vice versa (Zhuang et al., 2010). This is how friendship enhances relational commitments (Ling and Li, 2011; Chen et al., 2015). As for the relationship between *renqing* and *mianzi*, *mianzi* shows power and prestige, influencing one's ability to grant favours in social networks (Hwang, 1987; Yen et al., 2011). The higher a person's social status, the more powerful their *mianzi*, resulting in higher levels of trust and the ability to seek *renqing* (Barnes et al., 2011; Chan, 2008; Zhuang et al., 2010).

-----Figure 2-----

Although previous studies have investigated guanxi through the lens of social network theory (e.g. Hammond and Glenn, 2004), this study contributes by exploring the constructs of social networks further, providing a clearer picture of what guanxi networks are and why they matter in managing supply chain issues. In social network studies, the constructs of trust, reciprocity, justice orientation and care orientation are reflected as *xinren*, *renqing* and *ganqing* in guanxi networks. Likewise, guanxi networks are shaped in specific institutional environments and influenced by individuals' reputations and powers within the networks (Chang, 2011). However, guanxi networks extend the constructs of social network studies with the consideration of *mianzi*. *Mianzi* and 'face' giving are essential in Confucianist culture, meaning those within the same social networks must help to prevent each other from losing face. An individual's *mianzi* shows how much social power, perceived social position and prestige he or she controls (Hwang, 1978). Therefore, having significant *mianzi* indicates a strong network position, which increases the tolerance level for uncertainty in supply chains (Cai et al., 2013). There is a need to further explore *mianzi* and its impacts on SCM decision making.

4.3 *The influence on supply chain capital*

When discussing the influences of guanxi networks, there is a lack of consensus on whether guanxi remains important when institutional environments are becoming more transparent (Standifird and Marshall, 2000). The movement to eradicate corruption and bribery from government might create more sensitivity when interacting with officers (Gabriel and Zhao, 2012). But in the business environment, it is naive to draw a clear line between formal contracts and social networks. Grannovetter (1992) argued that 'economic action and outcomes, like all social action and outcomes, are affected by others' dyadic (pairwise) relations and by the structure of the overall network of relations' (p.33). Hammond and Glenn (2004) explain, from a social network perspective, how the embeddedness of guanxi created order and predictability through a set of relations including weak ties and strong ties to stabilise the flow of information among ties and allow for adaptation to incremental change. Therefore, this study has taken a social network view and attempted to examine the impact on supply chain capital and sustainability implementation in SCM.

This study has found that guanxi networks influence the flow of social, financial and human capital in SCM, linked to Burt's (1992) study in social network study (Appendix 4). Social capital lies in relations among people, identifying 'certain aspects of social structures by their functions' (Coleman, 1988, p.S101). The review shows that guanxi networks substantially influence the flow of social capital in a supply chain. Guanxi networks encourage the exchange of trust, benefits and reciprocity among various stakeholders, including customers, suppliers, work competitors, government institutions and communities. As a result, interpersonal relationships and interactions enhance communication and understanding within supply chains (Cai and Yang, 2014). Cheng et al. (2012) and Yang and Wang (2011) further argued that good guanxi networks in supply chain drive long-term supply chain efficiency and development. These develop and increase confidence in relationships and encourage positive attitudes toward supply chain integration (Nonini, 2014) and collaboration (Ramasamy et al., 2006; Wang et al., 2016), thereby improving organisations' capability to respond to customers and solve supply chain problems (Wiegel and Bamford, 2015). Not only do guanxi networks promote integration and collaboration in supply network, a high level of guanxi drives close alliances and partnerships between competitive organisations. For example, Wong and Tjosvold (2010) have collected data from 100 paired competitors in China and found that a high level of guanxi networks can reduce conflicts by encouraging cooperation rather than a competitive approach.

Among the constructs, trust plays a central role in in operational and risk management in SCM.

There is consistency amongst papers identified in the review that continuous and consistent interactions cultivate trust to enable a bilateral flow of social transactions and encourage the exchange of information in operational and contractual arrangements (for example, see Ling and Li, 2011 or Ranfagni and Guercini, 2014). This can lead to improved supplier performance (Cheng et al. 2012). Guanxi networks and trust were addressed in domestic business to reduce institutional and operational risks (Berger and Herstein, 2015; Cai and Yang, 2014; Wong, 2010; Rahman et al., 2017). Ranfagni and Guercini (2014) have also examined the role of guanxi networks to foreign companies. They conducted a case study of the Ferrero Group in China and argued that trust can reduce relational risks between foreign firms and local distributors. Based on the evidence from the review, we argue that trust is a universal context rather than specialised in a particular society, even though the actions of behaving trustworthy could be socially constructed.

Observations in this study show a clear link of guanxi network and financial capital flow in SCM. Financial capital consists of the economic resources used by companies to produce and serve their customers' needs, including factors such as cash in hand, investments and lines of credit (Burt, 1992). This study has considered the supply chain functions and strategic goals which drive for financial capital ultimately. Guanxi networks smooth transactions and reduce operational costs in supply chain activities, which encourages actors to setup long-term strategic planning for supply chain effectiveness and efficiency (Berger and Herstein, 2015; Chung et al., 2015; Dorothy et al., 2007; Jia and Zsidisin, 2014; Fearon et al., 2013).

Sustained guanxi networks ease the process of procuring necessary resources (Ramasamy et al., 2006; Chen and Wu, 2011). Chen and Wu (2011) drew on the insights from social capital theory and, following a survey of 409 firms in China, claimed that guanxi with business partners plays an important role in resource acquisition as a corporate capability. In addition, as a type of social capital, guanxi networks facilitate firms' access to tangible materials and intangible information regarding local supply and demand (Chan, 2008; Chen et al., 2013). Besides, mutual understanding and interdependency with suppliers drive flexibility and transparency in procurement processes. Giannakis et al. (2012) conducted two surveys and intended to investigate factors that inhibit effective supplier relationship management from Chinese suppliers for Western firms. In their results, guanxi affected the sourcing processes, including supplier search and negotiation process, and the type of contract to be signed for. Similarly, Kam and Chen (2011) found that guanxi networks in buyer and supplier relationships influence order quantities for the sourced products.

In the global supply chains, it is essential to coordinate dispersed supply and manufacturing to achieve efficiency and responsiveness. Often, this is affected by logistics competence and the evidence is mixed on whether guanxi has an influence or not. Previous studies show that in Chinese supply networks, guanxi must be acknowledged in dealing with factors for global logistics competence, including factors in IT infrastructure capacity, manufacturing flexibility, and asset specificity (Li and Lin, 2006). Gabriel and Zhao (2012) further argued that guanxi networks could improve logistics and service performance. Good guanxi in supply network helps firms to acquire timely deliveries, ordering, forecasting (Chen and Wu, 2011; Giannakis et al., 2012) and enriches a company's knowledge pool about customers (Chen and Wu, 2011). However, critical views posited that guanxi networks themselves does not directly affect global logistics competence and performance and it remains uncertain the extent a strong guanxi culture can foster logistics competence in a global context (Li and Lin, 2006).

Besides, good personal relationships between staff and customers raise awareness of the latter's needs. Organisations can then satisfy customers by, for example, producing specialised products and delivering just-in-time (Lu et al., 2009). Thereby, companies fulfil customers' needs better than their competitors and mitigate switching behaviour by customers (Hsu et al., 2011; Jia and Wang, 2013). Though interpersonal relations occur at an individual level, Gu et al. (2008) argued that, by understanding and managing the boundary-spanning process, organisations can 'corporatize' interpersonal connections into corporate relationships and transfer interpersonal trust to inter-firm trust. After long-term and harmonious interactions, it is likely that actors will establish strategic goals to configure supply chains (Park and Luo, 2001) with an emphasis on market effectiveness (Chen and Wu, 2011), supply chain flexibility and operational efficiency (Lin et al., 2012).

Guanxi networks also increase the flow of human capital in SCM. Human capital refers to the skills and working capabilities available for certain tasks (Burt, 1992). It is less tangible and embodied in the skills and knowledge for individuals. Coleman (1988) argues that human capital is created in social capital in the family and community, facilitating productiveness in the workplace. In SCM, human capital is inherent with information and IT technique to improve employees' practicing skills and working capabilities. Based on mutual trust and reciprocity, guanxi networks encourage information sharing and technology integration in supply chains. Chen et al. (2015) revealed that familial and government ties improve information associability and resource availability, facilitating support for entrepreneurial success, especially in creative industries where guanxi with political leaders influences new investment ventures. Likewise, Cai et al. (2010) found that guanxi affects information integration by building trust with trading partners. Through guanxi networks, information and technical support, such as technical innovation and manufacturing technologies, are shared and transferred from a company's staff to its customers and/or suppliers (Luk et al., 2008). This then improves employees' working capabilities to ensure product quality (Wiegel and Bamford, 2015) and production effectiveness (Chang, 2011; Choi et al., 2012; Ling and Li, 2011). These studies make the argument for the central role of trust in enabling knowledge transfer and information security, as discussed previously.

Good interpersonal relationships between managers and staff represent harmonious relationships between firms and their employees. Through efficient communication and shared understanding, guanxi gradually cultivates synergistic sentiments among staff members, enhancing cooperating behaviours and institutional loyalty (Wong et al., 2001). Therefore, relational risks in employee management could be mitigated (Chen et al., 2013). Furthermore, driven by emotional commitments, managers are more likely to provide training to improve technical skills (Kam et al., 2011), resulting in increased employee working capabilities. It is mutually beneficial for both the companies and their employees. Companies can increase their SCM performance and reduce labour costs through sufficient employee management (Choi et al., 2012), while employees have a better working environment and more opportunities for obtaining training and improving their working capabilities.

However, to some extent, the practice of guanxi networks and the experience of increasing flow of human capital in SCM could be specialised in individual cases. Hsu et al. (2011) illustrated that foreign firms face disadvantages with networking in China due to cultural and language barriers. For domestic private firms, compared to government-owned companies, the primary advantage is 'flexibility' (p.488). With fewer restrictions due to rigid financial rules, executives of domestic firms have more freedom to build relationships through guanxi and, therefore, gain higher returns from managerial ties.

Human capital can also enhance financial capital (Figure 3). Supplier management is closely linked with the social capital of buyer and supplier relationships. However, studies have emphasised how guanxi networks improve the capability of suppliers to enhance their operations performance. Lobo et al (2013) conducted an empirical study proving that vegetable growers can effectively use good interpersonal relationships to reduce waste and improve the quality and safety of their products. Hsu et al. (2011) collected in-depth interviews with top executives from economy hotel chains headquartered in China and claimed that guanxi, functioning as managerial ties, facilitates high-quality products and services offered by employees (Hsu et al., 2011). Good relational ties between employees also drive productivity and product development (Ling and Li, 2011). Empirical studies show that guanxi networks harmonise working environments and reduce internal conflicts, leading

to better performance in a variety of contexts, including lean production (Wong, 2010), ERP implementation (Choi et al., 2012) and mass production (Chung, 2005). Therefore, the social capital of good relationships between players significantly influences actors' behavioural performances and yields financial capital at the organisational level.

-----Figure 3-----

SCM studies have raised awareness of the contribution of network and network analysis (Capo-Vicedo et al., 2011). The goal of studying a social network is to explain why networks benefit, in particular, from effectiveness and efficiency in SCM (Galaskiewicz, 2011). High-quality personal ties reduce opportunistic behaviours and promote long-term cooperation and collaboration. Sometimes, close links between individuals are criticised for increasing risks due to locked-in and inappropriate management decision-making (Chen et al., 2011; Shou et al., 2011). The flow of supply chain capital could be substantially increased by firms considering relationships within a network as a whole, rather than being locked-in to dyadic relationships with specific suppliers/customers.

Herfindahl and Kneese (1974) raised the importance of human capital to increase productivities and manufacturing outputs. This perspective was later consolidated by Victor (1991) to embrace the three elements of sustainability. Increasing supply chain capital flow enhances a company's capability to implement sustainable SCM and to efficiently use manufactured capitals to substitute for vast consumption of natural capitals. Guanxi networks embed supply chain capital flows in business dealings, although the current research gap has not yet indicated how the flows of capital linked to guanxi network embeddedness can lead to the implementation of sustainable SCM. The purpose of this study is to bridge this gap, further exploring sustainable SCM implementation.

5. Theoretical framework building of guanxi networks in sustainable SCM

Theoretical framework building in this section is supported by both the underpinning literature derived from social network theory and the findings from the systematic literature reviews (i.e. constructs of guanxi networks and supply chain capital).

5.1 Institutional forces for sustainable SCM

Jones et al. (1997) argued that, without any particular institutional logic, a social network does not indicate any meaning of a network—a social network is the carrier for institutional logics. In emerging markets, motivations to pursue sustainable SCM include pressures from stakeholders and institutions (Zhu et al., 2013). Such institutional forces create an institutional logic of sustainable SCM implementation in social networks because all organisations are embedded within the complexity of relational and institutional contexts (Owen-Smith and Powell, 2008). The elaboration of social networks rapidly spread the institutional logic to various models of connections (DiMaggio and Powell, 1983), influencing sustainable SCM implementation in decision-making and organisational behaviours. This argument has been reflected in the study from Zhuang et al. (2014) which found that guanxi influences actors' decision making for ethical purchasing. Hence, the social network is the carrier of institutional forces for sustainable SCM. In other words, individual behaviours and decision-making are shaped by macro-institutional requirements. Therefore (Figure 4), we assert the following:

P₁: Due to the institutional forces of sustainable SCM, guanxi networks carry institutional logics and imbue them into people's consciousness within the network connections.

----- Figure 4 -----

5.2. SC capital flow in guanxi networks

The impacts of the extension of individuals' friendship networks are the diffusion and spread of diverse phenomena, information and opportunities within the constructed social networks (Grannovetter, 1978; Christakis and Fowler, 2007). As shown in Section 4.3, guanxi networks drive the effective and efficient flow of finance, human and social capital in supply chains. The feature of transferability in guanxi networks enables network extensions and the flow of supply chain capital (Figure 5). Supposing that guanxi ties A-B and A-D exist, A could act as a bridge to introduce B and D. Likewise, A could be connected to E and C through D and B respectively. In guanxi literature, this is called transferability (Park and Luo, 2001), while in social network studies it is called the connection of weak ties (Grannovetter, 1973). The consequence of weak ties (such as E-C) would be more and shorter paths from the creation of the local bridge (such as A-E and A-C) (Grannovetter, 1973). Capital flow along these pathways in both directions, even though there is not always a balance between them. Through network transferability, companies and their supply chains, on one hand, could better obtain the necessary financial flow to support green SCM implementation (Cai and Yang, 2014), such as environmentally-friendly products development, reverse logistics and product life-cycle control. On the other hand, the extension of network size and enhanced relational ties through guanxi reduce relational risk and uncertainty in supply chain relationships, which then encourages sustainable SCM collaboration (Luo et al., 2015) and stimulates enhancement of human capital in knowledge and technology sharing (Cheng, 2011). Therefore, we develop the following proposition:

P₂: The flow of SC capital in guanxi networks enhances firms' capabilities to respond to the institutional force of sustainable practices, resulting in enhanced sustainable SCM implementation.

----- Figure 5 -----

5.3 Influence of trust in guanxi networks

The systematic review highlighted trust as a key aspect in guanxi networks and the generation of *xinren* (trust) from *ganqing* (emotional affection), *renqing* (reciprocity) and *mianzi* (saving and building face), referring to Figure 2. In social network theory, trust links with the concept of social 'generalised morality' (Grannovetter, 1992), where relationship quality in stable social networks creates the general understanding and social morality of being trustworthy and willing to trust others (Levin and Cross, 2004). Trust is in the social justice and generalised morality of exchanging obligations and offering/returning *renqing* when guanxi partners require it. Besides, the higher the levels of *ganqing* and *mianzi*, the more possibility that one partner will trust another in practice. In this case, on one hand, a person could then build up their trust levels and cultivate social capital; on the other hand, social justice could be generated for relational governance in guanxi networks—once someone breaks the hidden rule, the cost of misfeasance is fairly expensive, and it is difficult to rebuild social networks (Grannovetter, 1985; Park and Luo, 2001).

Investment in sustainability can be specific and complex (Gimenez and Tachizawa, 2012), which can create hesitation and uncertainty for many companies considering investing in environmental and social responsibilities in SCM. Embedded trust among players does not reduce the risk and vulnerability involved in implementing sustainable SCM but increases the ‘willingness of a party to be vulnerable’ (Mayer et al., 1995, p.712). The structure of relationships and positions in a network shapes reciprocal influence and the scope of sustainability interactions as well as the depth of understanding, commitment and collaboration (Vurro et al., 2010). Through long-term interaction, players raise a certain degree of understanding and commitment among each other. Relational risks in inter-organisational relationships can be mitigated (Cheng 2011), which then increases the trust level for players to integrate and collaborate for sustainable practices. For example, to reduce environmental impact, players can integrate logistics competency and research and development, share knowledge and upgrade technology. Demonstrating a reputable image and trustworthiness to different stakeholders, companies and their supply chains should provide a good working environment and fair practices, taking responsibility for the wellbeing of community and society. Ultimately, these initiatives would increase social sustainability. Therefore, we argue this:

P₃: Trust in guanxi networks shapes the understanding of the institutional forces of sustainable practices, and mediates the willingness to implement and results from sustainable SCM.

5.4 Network governance in guanxi networks

Unlike authority, bureaucratic roles or institutional regulations, guanxi networks generate mechanisms that govern individuals’ behaviours in terms of social selection. To be inclusively accepted in social networks, autonomous firms need to adapt, coordinate and safeguard exchanges (Jones et al., 1997). In social networks, people have a tendency to select relationships where they share similar attributes; this trend is termed ‘homophily’ (Christakis and Fowler, 2007; Jones et al., 1997). If they share values and similarities, players are more likely to be included in guanxi networks. This is also influenced by the hierarchy constructs of *ganqing* and *xinren* (Mavondo and Rodrigo, 2001; Yen et al., 2011).

As discussed, guanxi networks increase the flow of supply chain capital and generate trust, which influences supply chain practices and performance substantially (Wiegel and Bamford, 2015). To remain informed of network economics, players need to be included as network insiders. In this case, a player ought to follow the social norms and institutional logics embedded in the social networks, which might consciously or unconsciously impact decision making in SCM practices, such as supplier and customer selection, corporate codes of conduct and compliance for sustainability in value chains. As such, the governance of the guanxi social network is practiced by the ‘imposition of the rules of inclusion’ (Castells, 2011, p.775).

Another argument about network governance is that, through frequent interactions and communications, people share understanding and vision about sustainable SCM and reduce heterogenic behaviour in the social network (Christakis, 2007). Companies that passively react to sustainable SCM tend to balance the trade-off of adaptation and coordination in sustainable SCM with their network members and the potential benefits embedded in the networks. Therefore, we propose the following:

P₄: Guanxi networks create the governance mechanisms of social selection and network homogeneity to enforce supply chain practices toward institutional forces of sustainable practices, resulting in the increase of sustainable SCM implementation.

6. Discussion and implications

6.1. Discussion

Growing evidence shows the challenges of lacking corporate capitals while managing institutional and stakeholder pressures towards sustainable SCM (Vurro et al., 2010). Different approaches to sustainable SCM focus on organisational or transaction-specific situations, even though it is commendable to establish a wide range of considerations for sustainability in SCM (Carter and Jennings, 2004; Vurro et al., 2010). In the discussion of sustainable implementation and performance measurements in SCM, researchers call for the involvement of all actors to tackle sustainable supply chain issues, such as information asymmetry (Beske-Janssen et al., 2015; Sarkis, 2012), and to drive sustainability commitment. In emerging areas and transitions, improving accessibility for resources is crucial to assure quality standards and overcome supply chain problems (Dries et al., 2013).

This paper has shed light on the influence of social networks on sustainable SCM implementation. In this study, we have argued that guanxi networks increase the flow of supply chain capital for efficient and effective supply chain practices (Figure 5). This result addresses the second research objective for the paper. Observations show that the main types of capital influenced by social networks in supply chains are financial, human and social capital, within which social capital influences the flow of financial and human capital (Figure 3). These types of capital are necessary to increase the implementation of sustainable SCM under institutional forces and network governance. Consequently, a conceptual framework was built to meet the final objective of the paper.

Driven by guanxi networks, social capital with various stakeholders reduces uncertainty and risk in supply chain practices. Through efficient communication and behavioural exchanges, guanxi networks strengthen buyer and supplier relationships (Geng et al., 2017) and mitigate uncertainty for sustainable SCM implementation, including green SCM (Zhan et al., 2016) and green supply chain collaboration (Luo et al., 2015). The guanxi network is a hierarchical concept advocating long-term satisfaction from both sides (Hwang, 1978; Yen et al., 2011), which then cultivates prolonged relationships for reserving necessary capital and resources for sustainable SCM implementation.

Building up guanxi networks with stakeholder influence of financial capital in supply chain performance in procurement, production and services is a necessary part of logistics to achieve strategic goals. Social networks decrease transaction costs and so lead to financial gain (Chen et al., 2011). It is not necessary that every firm invest in sustainability practice when they enhance their financial capital; however, in many ways, business and supply chains struggle to show the financial merit of investments in implementing environmental and social responsibilities in a variety of intangible and tangible assets (Barnett, 2007). Therefore, sufficient financial capital is regarded as the fundamental condition to invest in implementing sustainability responsibilities in a supply chain.

The influence of human capital in sustainable SCM is mainly comprised of knowledge and technical skills in improving working capabilities in supplier and employee management. Social network inheres opportunities to spread the technical skills and professional knowledge of sustainable SCM to a wider audience in supply chain networks. This raises

awareness and increases behavioural commitment to the implementation of sustainable SCM. Supply chain capital is spread in social relations with repeated contact between people over a long period of time (Burt, 2001), meaning the flow of capital is more likely to be increased through the logic of 'helping your friends is helping yourself'. In reality, not all companies have knowledge of sustainable development or facilitate the capabilities of investing in sustainability (e.g. recycling materials or reducing CO₂ emissions). The key players, who are not necessarily experts in the field but know more about sustainable SCM, could offer to help and show their willingness to do so by, for example, sharing relevant information (Hammond and Glenn, 2004).

Understanding what business is actually about is comprehensive. After building the relational bridge as Figure 5 shows, to what extent actors proactively engage in the flow of supply chain capital remained uncertain. According to Cox (1999), companies can only succeed by possessing their power and control over someone – customers, suppliers, employees or even social network members in the discussion here. Even though social networks mitigate power asymmetry, the flow of supply chain capital may not be equally distributed among supply chain actors – the actors possessing more power could dominate the flow of supply chain capital over other parties. For example, a company can dominate the financial flow in the social networks based on their economies of scale; or a focal company could decide the degree of sharing core information with their suppliers or customers. The discussion of guanxi networks and their impacts on flow of supply chain capital develop the insights of how interpersonal ties influence on supply chain practices. However, it is not a linear relationship when human factors involve.

Guanxi networks create the governance mechanism to constrain behaviour to the minimum requirements for performing sustainability in SCM. This is driven by the requirement of following the social norms of *renqing*, *xinren* and *mianzi* to secure transactional benefits and supply chain capital flow in networks. Conversely, companies positioned in the centre of networks with a certain density would initially participate in implementing and diffusing sustainable SCM due to institutional force and global competitiveness. Organisations would execute collaboration and integration across organisational boundaries to acquire resources embedded in the networks (Chen and Hung, 2014). To avoid behavioural heterogeneity, they would elect partners who share similarities and help 'insiders' implement sustainable SCM with financial and human capital support.

A critique may call attention to a counter-factual case, such as 'Are there any comparisons with sustainable businesses with no guanxi or equivalent?' or 'Is it possible that guanxi networks can lead to non-sustainable business practices?' The first critique questions the relationship between interpersonal ties and formal governance mechanisms. Xin and Pearce (1996) argue that personal connections are substitutes for formal institutional support. According to their empirical results, particularly in private companies, executives sought to compensate for a lack of formal institutional support (such as financial support from banks) by cultivating personal networks. This is consistent with a study by Hsu et al. (2011), which shows that private companies tend to be more flexible in using the resources of social networks. Therefore, private companies might find the developed model in Figure 4 more applicable to making good use of personal connections for cultivating trust and increasing supply chain capital flows in the networks for sustainable SCM implementations. State-owned companies and foreign companies, though, seem to rely less on personal networks, and they might face more pressure from institutional forces in implementing sustainable practices. However, regardless of firm ownership, it is naïve to draw a clear boundary

between the influences of social networks and formal governance. Heimer (1992) argues that helping one's friends and colleagues can increase productivity for one's organisation and its supply chains. Therefore, interpersonal relationships will always exist when people interact with each other within and across organisational boundaries.

The second critique questions the possibility of guanxi networks causing non-sustainable business practices. Such evidence, as identified from the systematic review, suggests that the answer is yes. Luo et al. (2014) found that guanxi networks can reduce the willingness to implement green supply chain cooperation, though most studies have shown the opposite. A high level of guanxi may require investment of more time and money in cultivating relationships. The dark side of guanxi could be linked with bribery, corruption and high social costs (Huang et al., 2011). Because of these possibilities, this study considered the institutional force of sustainable development in its model. In the short term, firms might take advantage of guanxi networks to achieve economic goals; however, in the long run, under the institutional pressures of sustainable development, practitioners would cognitively select those who share similar values of sustainability to sustain economic development.

6.2 Implications

6.2.1 Social network theory and the impact on sustainable SCM

For academic research, this paper first extends the construct of social network theory from the Western context. Without understanding the constructs of guanxi networks, it is difficult to interpret the mechanisms underpinning business and supply chain practices from a social network perspective in Confucianist culture. In Western literature, driving factors for network connectedness usually rely on reciprocity, trust and care in some conditions (Heimer, 1992) while, in Confucianist culture, *ganqing* and *mianzi* play essential roles in guanxi networks used to sustain long-term relationships and enhance social influence. We also found that *ganqing*, *renqing*, *xinren* and *mianzi* are interconnected (Figure 2). From this perspective, the development of trust could be enhanced by exchanging *renqing* and *ganqing* among individuals and increasing reputation and *mianzi* in a society. Social capital and trust have been widely studied in supply chain literature (e.g. Cheng et al., 2011). This review provides insight into building and taking advantage of social networks and their constructs in Confucian societies in order to support supply chain collaboration and sustain supply chain performance.

This study has also attempted to fill the current research gap with regard to sustainable SCM. Literature reviews (e.g. Touboulie and Walker, 2015) show that the social network perspective of behavioural commitment to sustainable SCM is lacking in insight and that social network research is called for (Wichmann and Kaufmann, 2016). Sustainable SCM requires involvement from players thorough the supply chain (Tachizawa and Wong, 2014); however, how to generate this effort remains unspecified in the literature. This study offers an alternative answer: through increasing the flow of supply chain capital, including financial, human and social capital, a company can increase its capability and collaboration in investment in environmental and social responsibilities in the supply chain. In additional, social networks play a complementary role to institutional forces in creating network governance of encouraging organisational behaviour and supply chain practices to implement sustainable development.

In addition, global SCM is rather complex and embraces many cultures, In China and in other emerging areas, such as the Middle East, Brazil and Russia, social networks play an important role in dealing with local stakeholders and institutions (Abosag, 2015; Abosag and

Naude, 2014; Chen et al., 2010). Testing the framework in these alternative environments would show the wider generalisability of the propositions and whether cultural uniqueness exists with regard to SCM.

6.2.2 Implementation through managerial practice

Guanxi networks exist objectively and significantly influence SCM observations. By taking advantage of interpersonal ties, companies can gain necessary supply chain capital and increase the flow of capital in the social network, which then enhances the companies' capabilities in dealing with supply chain issues, including sustainability development. Currently, sustainable SCM is yet to be institutional and stakeholder driven (Carter and Easton, 2011). However, research has indicated that investing in sustainability practice, such as corporate social responsibility, has yielded beneficial financial performance to some extent (Barnett, 2007). Proactively implementing sustainable SCM helps a company to gain a competitive advantage and ultimately enhance its economic performance. The value of implementing sustainable SCM is clear, and this study explains how (through the flow of supply chain capital and trust in social networks) and why (through institutional force of sustainability development) a company and its supply chain ought to implement environmental and social responsibility apart from simply pursuing economic accountability in the long run.

Practitioners also need to be aware that, in weak institutional environments, materialisation and gift-giving occurs in order to directly exchange *renqing*, which is considered corrupt, immoral and against company procedures in using *guanxi* (Huang et al., 2011). Therefore, it is necessary to ensure that behaviours comply with legal regulations and company principles. However, reciprocal benefits for practitioners can also be obtained through *ganqing*, *xinren* and *mianzi*, as addressed in Figure 2. However, given that *ganqing*, *xinren* and *mianzi* are hierarchical processes, actors need to cultivate them during every interaction. As previously noted, *ganqing* is closely linked with a care orientation in western networks; thereby embracing empathy and care are important for relationship development. One's prestige and reputation in the society relates to *Mianzi* and Hwang (1987) has given a thorough discussion of the power of *mianzi* in Confucius culture. To increase *mianzi* and social influence, companies and practitioners need to behave trustworthily while sincerely caring for people and the society. Michelon (2011, p.79) argued that 'a company's reputation is a determinant of sustainability disclosure'. In other words, implementing sustainable SCM can enhance corporation reputation, which then empower *mianzi* for employees from the corporation. *Xinren* is fundamentally important for relationship management in either the East or West as discussed. It is necessary to behave trustworthily and be responsible for the network members. Therefore, by facilitating the knowledge of the constructs of *guanxi* networks, actors could be more proactive towards relationship building and engagement in daily business activities and avoid unethical practices.

7. Conclusions

By reflecting the social network perspective put forward by Grannovetter (1973, 1992) and Burt (1992), this paper considers how social networks can support the implementation of sustainable SCM. Social networks are socially constructed and, while found in many cultures, there has been a focus on Confucian cultures, and specifically *guanxi* networks. The systematic literature reviews have provided insights into the current state-of-the-art in the constructs of *guanxi* networks and their influence on the flow of supply chain capital and sustainable SCM. The constructs of social networks in Confucius cultures are reflected as *ganqing*, *renqing*, *xinren* and *mianzi*, which affect supply chain practices substantially.

Regarding to the research topic, there is a good range of research that address the influence of guanxi networks on the flow of supply chain capital, namely social, financial and human capital, but a paucity of work that considers sustainable SCM explicitly. General works cover some aspects of sustainable SCM, but opportunities remain for exploring these aspects in more depth.

The proposed theoretical framework and propositions give awareness of how formal institution and personal ties affect the implementation of environmental and social practices in a supply chain. Institutional forces for sustainability have provided the logic of sustainable practices in SCM whereas implementations in different regions are socially embedded. Research calls for the acknowledgement of the uncertainty adhered in a complex environment (Alexdander et al. 2015). The framework is inherent with this complexity, finding ways to increase network economics, trust and network governance for companies and their supply chains to implement environmental and social practices.

This study makes three main contributions. First, a systematic review of the constructs of guanxi networks extends the context of social network theory from Western literature. This shows the value and necessary approach to building and maintaining guanxi ties in Confucius culture to leverage business and supply chain performance. Second, the study reveals the logic of building trust and increasing supply chain capital flow in social networks. This is essential for assurance of business operation and strategic planning for long-term corporate goals. Finally, by understanding the mechanisms of sustainable SCM implementation from a guanxi network perspective, this study provides propositions through which to develop the research area.

Being conceptual in nature, this paper draws on secondary empirical evidence to support its arguments. This represents a limitation, and further research could draw on empirical evidence to test the proposed propositions. The next phase in the research would be to examine further the conceptual framework addressed in Figure 4. Four propositions have been developed with detailed constructs of the variables (e.g. the flow of three capital in supply chains), which supports the development for various quantitative tests. Survey and social network analysis could be adopted to discuss on how the constructs of guanxi influence the network structures, including centralisation and density, and how this affects the levels of flow of supply chain capital and SCM performance. Drawing on the influence of firm ownership (Xin and Pearce, 1996), moderating tests could establish whether guanxi networks influence sustainable SCM practices more in domestic firms than in foreign-owned companies. These developments reflect on the complex nature of business environment as discussed in Section 6.1.

In addition, investigating the underlying mechanism of implementing sustainable practices requires in-depth insights from qualitative studies, such as case study or ethnography. For instance, is there alignment between the description of social sustainability by companies and the interpretation of this from their employees? How social networks impact on sustainability disclosure and under what circumstances do companies empower their employees and suppliers to drive sustainable SCM? Researchers should also consider how to observe the negative aspects of guanxi, and whether questioning through conventional methods will generate insights.

Finally, the circular economy is another emergent topic in sustainable SCM that requires a highly degree of integration in supply chains (Ghisellini et al. 2016). Given that the literature

suggests guanxi networks stimulate recourse and relational integrations in SCM (Cat et al., 2010; Nonini, 2014), further research could be developed to investigate the influence of social networks on the performance of the circular economy.

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Figure 1: The selection process of the sample

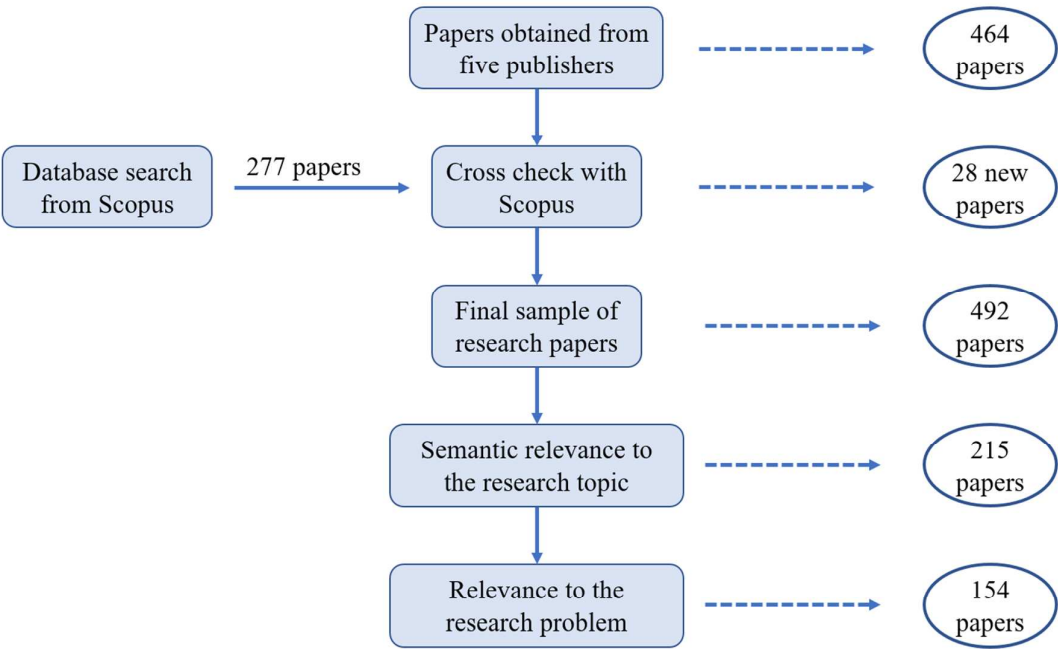


Figure 2: The constructs of guanxi networks

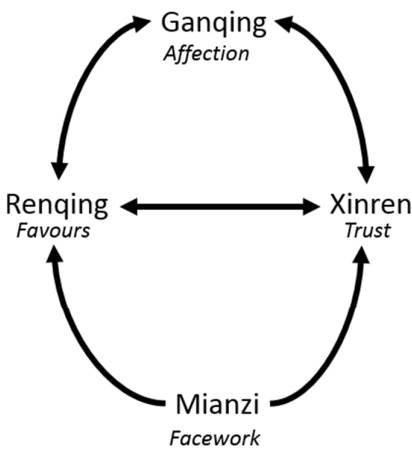


Figure 3: The impacts of guanxi networks in SCM

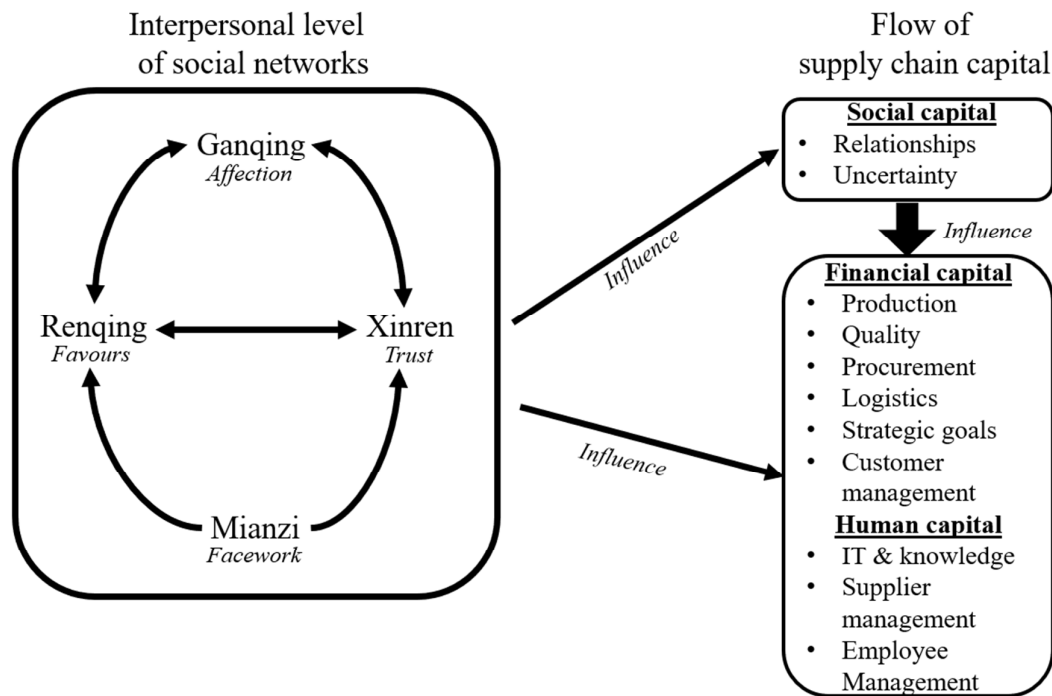


Figure 4: Theoretical framework

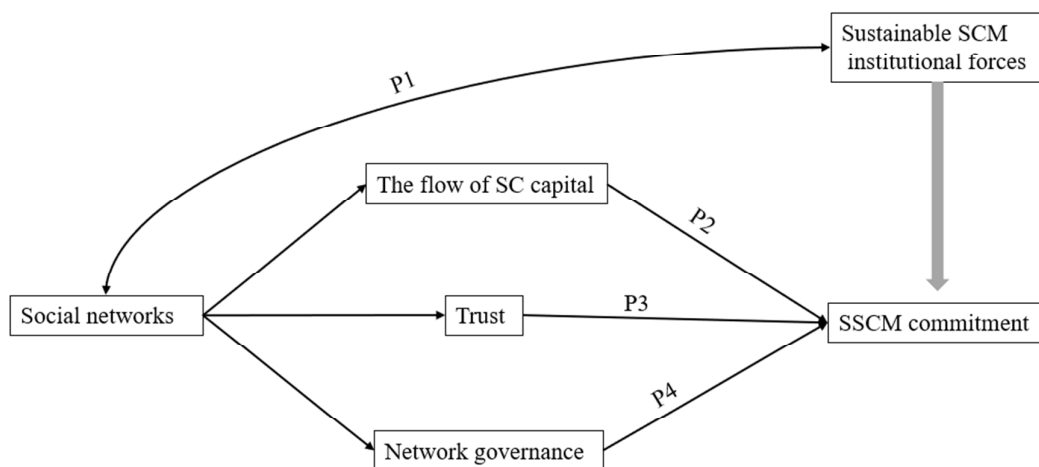


Figure 5: SC capital flow in guanxi networks

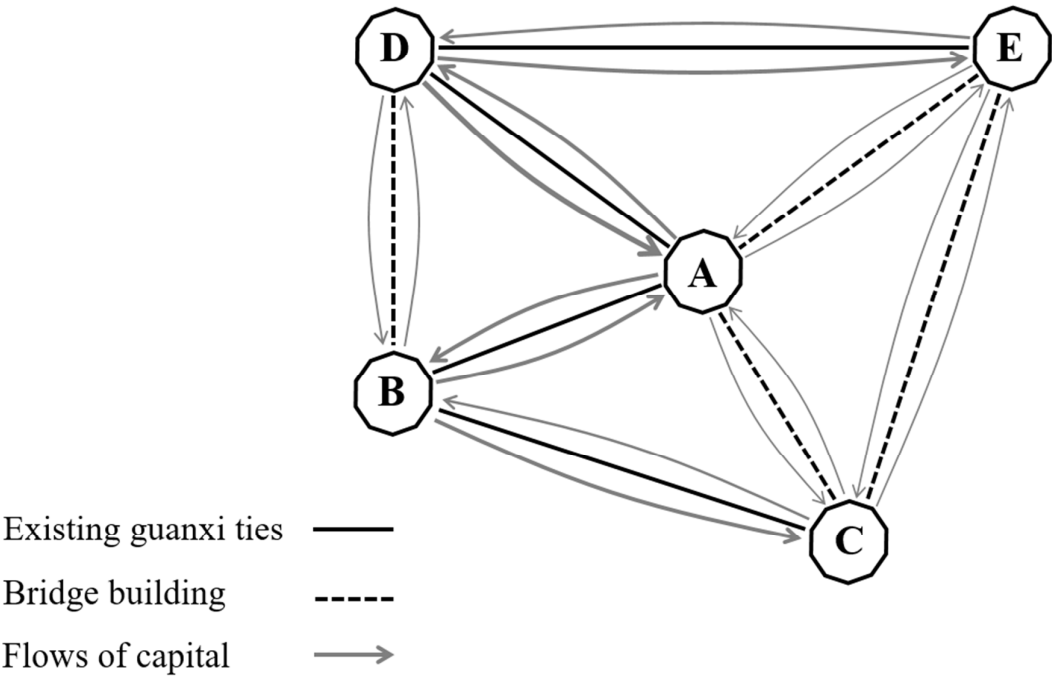


Table 1: SSCM themes in guanxi networks

SSCM themes	Guanxi networks	Reference
Green SCM	Moderation for an organization's business and environmental performance	Zhan et al (2016), Geng et al (2017)
Green supply chain collaboration	Guanxi positively mediates the relationship and green supply chain collaboration (GSCC); however, a higher level of guanxi among supply chain members may reduce the willingness to implement GSCC.	Luo et al (2015)
Relational risk	Increase the level of tolerated level of risk	Cheng (2011)
Knowledge sharing	The unwritten law of reciprocity improve the willingness to share essential knowledge	Cheng (2011)
Purchasers' ethical decision making	Guanxi can be either positive or negative moderate the purchasers' ethical judgement	Zhuang et al (2014)

Source: authors

TABLE 2: Studies of guanxi in SSCM from the review of guanxi in SCM

Dimensions	Selected authors
Impacts on economic performance	
Market performance	Chen et al., (2011), Lobo et al., (2013), Hsu et al., 2011
Financial profitability	Chen et al., (2011)
Business performance	Lobo et al., (2013)
Cost efficiency & effectiveness	Lobo et al., (2013), Hsu et al., 2011
Administrative protection	Hsu et al. (2011)
Economic performance	Hsu et al. (2011)
Business opportunities	Ling and Li (2011)
Impacts on social equity	
Substantial rewards	Michailova and Worm (2003); Park and Luo (2001)
Customer satisfaction	Luo et al., (2011)
Employee satisfaction	Hong and Engestrom (2004)
Harmony of the community	Ling and Li (2011)
Local residents' health	Wang and Woods (2013)
Relationship quality with stakeholders	Chen et al., (2013)
Social satisfaction	Chen et al., (2011)
Employee working environment and human rights	Herndon (2008)
Impacts on environment	
Green supply chain	Cheng (2011), Cai and Yang (2014)
Influences implementation and environmental policymaking system	Hills and Man (1998)
Upgrade technology to deal with wastewater	Hills and Man (1998)
Wastewater, waste gap pollution	Wang and Woods (2013)

Source: Authors

Table 3: Four dimensions of *guanxi*

Terms	Definitions	Terms in social network study
<i>Renqing</i>	Similar to the concept of owing favours or reciprocity (Chen and Chen, 2004)	Reciprocity
<i>Ganqing</i>	Implies affection, sentiment, and emotion (Yen et al., 2011)	Care orientation
<i>Xinren</i>	Relating to trust (Chen and Chen, 2004)	Trust
<i>Mianzi</i>	'Face', 'facework', impression management (Hwang, 1987)	N/A

Source: Authors

Appendix 1: Research protocol of the literature review I

Research protocol	Context: set of 'sustainable SCM' and guanxi
Conducts of review	Descriptions
Publishers & database	Scopus and ABI
Publication type	Peer-reviewed papers only: These papers represent the final stage of completion.
Language	English only: this ensures the wide range of coverage, while avoiding heterogeneity in translation. Also, this ensures transparency and the ability to replicate the review.
Data range	Exploring all peer-review papers published in all date range
Search terms and Search fields	(TITLE-ABS-KEY (guanxi) AND TITLE-ABS-KEY (green OR (environment* OR sustainab* OR ethic* OR responsib* OR 'triple bottom line' OR 'ecol')) AND TITLE-ABS-KEY ('supply chain' OR (supply OR purchasing OR procurement)))
Exclusion criteria	In total, 15 papers were circulated in Scopus and ABI. Exclusion criteria include: 1). duplicated papers from the database; 2). Relevance to the research topic. For example, some papers appear 'environmental' in the searching areas but it is irrelevant.

Source: Authors

Appendix 2: Research protocol of the literature review II

Research protocol	Context: set of ‘SCM’ and guanxi
Conducts of review	Descriptions
Publishers & database	Elsevier (Science Direct), Emerald, Taylor & Francis, Sage and Wiley: publishers which covered the most relevant management journals while not filtering out other related sources. Scopus is used to cross check the coverage and comprehensiveness of the study
Publication type	Peer-reviewed papers only: These papers represent the final stage of completion. There is no restriction on the journals included because this is an international research topic which could be published to audiences with various interests.
Language	English only: this ensures the wide range of coverage, while avoiding heterogeneity in translation. Also, this ensures transparency and the ability to replicate the review.
Data range	After running initial search, no major studies were published before 1995. Therefore, the data range started from 1995.
Search terms and Search fields	Supply (OR logistics OR procure* OR production OR inventory OR warehous* OR manufactur*) in all fields AND ‘guanxi in title, abstract or keywords. This approach captures a full picture of the influence of guanxi in a broad range of supply chain functions.
Exclusion criteria #1 Semantic relevance to the research topic	In the subject area selections, some topic areas are less relevant to the research topic, such as engineering, medicine, chemical engineering and could therefore be excluded directly in the sample. However, some areas, such as social science, psychology and humanities, could be relevant to the research topic depending on the contents of individual studies. In this case, the authors checked each paper one by one to select the most relevant to the research topic.
Exclusion criteria #2 Relevance to the research problem	In some cases, even though papers cover both research themes in the relevant topics, they did not provide evidence showing the interaction between two themes. Therefore, efforts were made to exclude such cases as they provide limited knowledge contributing to the research objects of this study.

Source: Authors

Appendix 3: Constructs of guanxi networks

Clusters	Definition	Included aspects	No. of papers
<i>Renqing</i>			153
Reciprocity	People within interpersonal relationships expect reciprocity concerning equity and the exchange of favours	Reciprocal expectation, utilitarian	62
Obligation	Informal relationships require one to fulfil obligations in the form of reciprocation of gifts and favours	Social obligations	44
Favour	This refers to the exchange of favours to promote cooperation and shared social experience among individuals	Favouritism, indebtedness, personal favours	38
Behavioural exchanges	Informal relationships refer to the interactive relationship between or among individuals with behavioural exchanges in order to establish mutual trust and cooperation	Mutual impacts, mutual benefits, personal exchanges	9
<i>Ganqing</i>			106
Emotional closeness	This reflects the tenor of a social relationship between individuals or organisations and the emotional attachment that exists among parties in a network	Human affection, human sympathy, interpersonal harmony	78
Commitment	This type of Confucianist relationship is holistic and embraces the involved long-term support of social, psychological and economic welfare of the whole person across all life domains	Protection, shared interests, cooperation, long-term orientation, longevity	28
<i>Xinren</i>			130
Trust	This refers to the confidence for the exchange within the partner and the willingness to take risks	Interpersonal trust, trusting relationships	109
Credibility	Credibility between individuals can increase trust, reliability and reputation	Social reputation, assurances	21
<i>Mianzi</i>			46
'Facework'	Saving 'face' includes a set of behaviours aimed at preserving one's own and the other's dignity	saving face	46
<i>Others</i>			33
Dependency	One party who is dependent on its partner's resources and capabilities values the relationship and therefore seeks to advance and stabilise it	Interdependency	23
Adaptation	This refers to a form of international inter-firm and external cultural and social learning and localisation	Localisation, adaptation	10

Source: Authors

Note: The total numbers of papers for *renqing*, *ganqing*, *xinren*, *mianzi* and other are calculated by adding up the number of papers in each sub-category.

Appendix 4: Review findings for the influence of supply chain capital in guanxi networks

<i>Cluster</i>	<i>Impacts of guanxi networks</i>	<i>No. of papers</i>
<i>Social capital</i>		
Relationship	In social networks, firms tend to rely more on arm's length relationships to build good relationships and commit to formal and informal collaborations	79
Reduced uncertainty	Social ties increasingly serve as mechanisms to reduce uncertainty and increase predictability because the players are likely to hedge their risk by using private or particularistic channels	41
<i>Financial capital</i>		
Procurement	They improve efficiency, save time and ease the procurement of necessary production resources	46
Production	Guanxi is important in internal integration, external adaptation and collaboration during production	38
Logistics	Global logistics' competencies and logistics infrastructures can be enhanced by leveraging guanxi networks	22
Strategic goals	Through close personal relationships, the supply chain strategically forms a variety of flexible and synchronising prototypes	18
Customer management	An organisation can obtain operational benefits by including downstream parts of the SCM	11
Quality	Good guanxi with main suppliers can help companies acquire quality products and superior services	8
<i>Human capital</i>		
Information technology	Information integration is necessary to help internal functions within the company identify critical issues	28
Supplier management	Personal relationships between individual buyers and suppliers can dramatically influence supplier selection, development and shared organisational values	27
Knowledge and learning	Good guanxi fosters understanding of knowledge and market signals	16
Employee management	Good guanxi with employees are expected to improve engagement and collaboration and control turnover rates	10

Source: Authors